

LEARNER USE OF HOLISTIC LANGUAGE UNITS IN MULTIMODAL, TASK-BASED SYNCHRONOUS COMPUTER-MEDIATED COMMUNICATION

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Second language acquisition (SLA) researchers strive to understand the language and exchanges that learners generate in synchronous computer-mediated communication (SCMC). Doughty and Long (2003) advocate replacing open-ended SCMC with task-based language teaching (TBLT) design principles. Since most task-based SCMC (TB-SCMC) research addresses an interactionist view (e.g., whether uptake occurs), we know little about holistic language units generated by learners even though research suggests that task demands make TB-SCMC communication notably different from general SCMC communication. This study documents and accounts for discourse-pragmatic and sociocultural behaviors learners exhibit in TB-SCMC. To capture a variety of such behaviors, it documents holistic language units produced by intermediate and advanced learners of Spanish during two multimodal, TB-SCMC activities. The study found that simple assertions were most prevalent (a) with dyads at the lower level of instruction and (b) when dyads had a relatively short amount of time to chat. Additionally, interpersonal, sociocultural behaviors (e.g., joking, off-task discussions) were more likely to occur (a) amongst dyads at the advanced level and (b) when they had relatively more time to chat. Implications explain how tasks might mitigate the potential processing overload that multimodal materials could incur.

INTRODUCTION

A significant amount of second language acquisition (SLA) research has sought to understand whether and how students acquire a second language in computer-mediated interactions (Belz & Reinhardt, 2004; Chapelle, 1998; Kinginger & Belz, 2005; Payne & Whitney, 2002; Smith, 2003; Thorne, 2008). This study responds to calls to complement highly focused analyses of learner behaviors¹ such as studying moves that constitute negotiation of meaning with a broad analysis that considers social, linguistic, and developmental factors (Tarone, 2007). It seeks to add to the growing knowledge about how to understand learners' communicative goals according to phrases' functions with respect to immediately surrounding words and phrases (i.e., the *parts*) and with respect to *holistic language units* (i.e., the *whole*: discourse functions, pragmatic intent, and social roles; Fetzer, 2007). This understanding is especially important since SCMC in the L2 classroom is changing, as it is increasingly used alongside task-based activities (Doughty & Long, 2003) and in rich multimedia experience (Collentine & Collentine, 1997). Yet, a review of the modest amount of research on TB-SCMC suggests that it leads to communicative behaviors that are different from general SCMC activities. Additionally, little SCMC research documents how learners communicate in task-based, multimodal, interactive environments (Blake, 2000 and Keller-Lally, 2006 represent notable exceptions), so that it is especially important to understand the holistic language units learners generate in TB-SCMC. After expanding on these issues, this study describes the holistic language behaviors exhibited by intermediate and advanced learners of Spanish in two Flash, task-based SCMC activities.

REVIEW OF THE LITERATURE

SCMC Background

There are various approaches to understanding how SCMC contributes to a theory of SLA. Some studies focus on the amount of language produced, who produces it and why, learner attitudes, and *whether* adequate interaction occurs in SCMC (Abrams, 2003; Beauvois, 1997; Blake, 2000; Chun, 1994; Freiermuth, 1998, 2001; Kern, 1995; Salaberry, 2000; Vandergriff, 2006; Warschauer, 1996). These studies generally show that SCMC engages learners in collaborative knowledge construction (Beauvois, 1997; Berge & Collins, 1995; Meunier, 1994; Warschauer, 1996, 1997) and that it provides an even playing field for all learners (Bruce, Peyton, & Batson, 1993; Kiesler, Siegel, & McGuire, 1984). Some research specifically investigates whether there is an intake of form (Blake 2000; de la Fuente, 2003; Smith 2003, 2005) or whether lexical acquisition takes place (de la Fuente, 2003). Other researchers have focused on documenting learners' macro language units (Abrams, 2003; Keller-Lally 2006; Sotillo, 2000)—the focus of the present study.

An important premise that underlies much of SCMC research is Chapelle's (1998) concern that researchers should not assume that frameworks intended to explain face-to-face (FTF) interactions can adequately describe what occurs in SCMC. This has helped researchers to better understand SCMC's unique aspects. A noteworthy recent example is Smith (2003), who modified Varonis and Gass's (1985) longstanding model of *negotiation routines* to include discourse-pragmatic interactions typical of TB-SCMC interactions. While the present study is not motivated by the question that Smith (2003) asks, (namely how negotiations in SCMC lead to intake) it does seek to contribute to our understanding of how learners generate meaning and interact at the level of holistic language units in TB-SCMC.

Documenting these holistic language units has been a focus of general SCMC research, perhaps because it informs practitioners about the overall types of behaviors they can expect from students in SCMC, resulting in a better coherence between activities and curricular goals. While this research comprises different theoretical perspectives such as sociocultural and interactionist views, this research has the goal of delineating the types of communicative behaviors that occur in this still new communication channel. Although a detailed description of the types of categories used in this study and their theoretical geneses is explained below (see *Categorizing learner behaviors in TB-SCMC*), it is important to describe some notable contributions to understanding the important holistic language units found in SCMC in general. Subsequently, the motivation for narrowing the present analysis to TB-SCMC within a multimodal learning environment is delineated.

Studies by Chun (1994) and Kern (1995) represent the first important contributions in this area, identifying the types of discourse elements and pragmatic features of SCMC. Similarly, Werry (1996) seeks to identify unique interactions within SCMC, finding a high degree of addressivity (i.e., the typing of a speaker's name at the beginning of a turn to clarify to whom that turn is directed), short turns, use of greetings unique to SCMC (e.g., *re = hello*, after re-entering a chat), a variety of mechanical conventions, and various behaviors that are clearly social in nature, such as register variability, verbal play, and spontaneous role-playing. Recently, Simpson (2005) explains how interaction is affected by CMC, documenting that SCMC yields disrupted turn adjacency and is characterized by topic drifts and shifts. Sociocultural researchers have also made recent important contributions. For instance, Warner (2004) emphasizes that SCMC involves a great deal of playful language, and Darhower (2002) demonstrates how learners develop their sociolinguistic competence while at the same time creating a *social community*. Finally, research on telecollaboration has identified important pragmatic motivations for how learners structure CMC and learn from it (Thorne, 2008), especially with respect to intercultural communication. In a notable contribution to our understanding of the language units found in SCMC, Belz and Reinhardt (2004) document L2 language play that leads to linguistic creativity, building of relationships, and keeping of a positive face.

TB-SCMC

Doughty and Long (2003)—and similarly Lafford and Lafford (2005)—argue for the avoidance of highly open-ended CMC tasks such as scavenger hunts and even guided SCMC discussions, recommending instead to follow task-based language teaching (TBLT) design principles in which “meaning is primary; there is a relationship to the real world; task completion has some priority; and the assessment of task performance is in terms of task outcome” (Skehan, 1996, p. 38).

TB-SCMC research has largely been focused on discovering the ways in which negotiation of meaning occurs. Although some of this research speaks largely to the effects of task conditions on learner behaviors, investigators are finding that communication in TB-SCMC is quite different from that in other types of SCMC. For example, Pellettieri (1999) found more *negotiation of meaning* in single-outcome than in multiple-outcome tasks, and more in form-focused tasks, e.g., writing a note, telling a story, than in non-form focused ones. Pellettieri concluded that the more focused students are on a task, the more negotiation occurs. On the other hand, Keller-Lally (2006), who looked at jigsaw-saw, decision-making, and opinion-exchange tasks, found no effect for group or task in terms of how frequently negotiated interactions occurred. Smith (2003) presented evidence that when TB-SCMC activities are seeded with novel lexical items, a good amount of negotiation, and therefore opportunities for intake, occur. Additionally, he reported that in TB-SCMC learner reactions to the *response phase* of negotiation routines reflect a high degree of focus on task completion since they often skip over explicit reactions like *I (don't) understand*, implicitly acknowledging their comprehension (or lack thereof) by making statements reflecting that they are reverting back to a task-completion mode. Smith's (2003) findings motivated him to modify the long-standing Varonis and Gass (1985) model of *negotiation routines* to include the aforementioned implicit reaction behaviors (holistic language units with discourse-pragmatic functions) that may be unique to TB-SCMC.

There exists additional evidence that TB-SCMC leads to distinctive SCMC language behaviors. Some TB-SCMC research suggests that students are likely to de-prioritize metalinguistic processing in favor of conveying meaning fluently and efficiently. First, Smith (2005) argues that task conditions and learners' tendency to attend to task demands do not allow them to fully internalize data from form-focused episodes. Lee (2002) conjectures that TB-SCMC prevents learners from reflecting on accuracy, concentrating instead on fluency and expressing meaning, much like they do in the face-to-face mode. Under task-based conditions, learners need to focus even more on being fluent and not accurate as they have an overriding goal to achieve: the completion of the task. Sotillo (2000) adds that SCMC in general is considered by students to be an informal mode of communication, where being fluent rather than accurate) is of primary concern. Second, larger language units may not always be the focus of negotiated interactions in TB-SCMC. Blake (2000) notes that in a study using jigsaw and information gap tasks, the amount of *syntactic negotiations* was very small compared to that involving individual words. Smith (2005) notes that since there is little need for coherence, and thus for complexity, because the chat log is available at any time, TB-SCMC may not lead to morphosyntactically-sophisticated negotiations. Chen, Belkada and Okamoto (2004) concluded that negotiation occurs in TB-SCMC, but question whether greater “listening comprehension or L2 development” (p. 47) occurs since they found that few syntactic miscommunications motivated negotiation.

Nonetheless, there appears to be much to learn about the types of holistic language units learners generate under TB-SCMC. If, in TB-SCMC, distinctive modes of interaction occur and learners attend less to metalinguistic issues, whether or not this is due to the task demands, then it is especially important to study the types of holistic language units that learners might generate in TB-SCMC. The overriding non-linguistic need to accomplish some task in TB-SCMC may induce learners to exhibit language behaviors and approach communication in general in ways that are unique to what has been documented to date about learner behaviors in SCMC.

The Need for Studying SCMC in a Multimodal, Task-Based Experience

Current language-learning technologies, such as Flash, can provide a multimodal experience that is highly contextualized (or even real-world like) and that engages learners with graphic, visual, and auditory information (Collentine & Collentine, 1997; Purushotma, 2005). These relatively inexpensive commercial authoring environments deliver content efficiently from a bandwidth perspective, allow for the creation of rich multimodal learning experiences, and will surely have an important role in Web 2.0 SCMC applications. Despite these advantages, most SCMC experiments employ only chat technologies. Of course, it may be unwise to combine SCMC with a sensory rich experience without considering the ramifications. Spiro, Feltovich, Jacobson, Coulson (1991) suggest that multimodal experiences may overload learners if they are ill structured; such materials need to be embedded in a structured fashion.

Coupling SCMC with multimodal, task-based experiences will provide an understanding of SCMC's potential within a rich interactive learner/user experience. In the study reported below, learners interacted with two Flash-based TBLT activities requiring them to uncover clues about a mystery and then discuss them in an SCMC environment. There is scant SCMC research set within a task-based, multimodal, interactive experience, although constructivist perspectives of learning support the use of multimodal technologies (Chun & Plass, 2000). Blake (2000) studied SCMC using jigsaw, information gap, and decision-making activities combined with Web-based graphical information. Warner (2004) coupled some chats with tasks that required researching travel destination details on the Web. However, most of her activities were role-plays. Some research has employed TBLT elements where SCMC was the sole technology. Smith (2003, 2005) as well as Keller-Lally (2006) used jigsaw and decision-making tasks. Freiermuth (1998, 2001) and Freiermuth and Jarrell (2006) asked learners to chat about how they would spend a sum of money, make plans for an international trip, and discuss where to start a new business, while Vandergriff (2006) asked learners to achieve a consensus on a moral dilemma. All told, we are only beginning to understand how learners use language in SCMC when their primary motivation for interacting entails task-based learning principles.

Categorizing Learner Behaviors in TB-SCMC

The study presented below attempts to add to our understanding of the holistic language units of learners in TB-SCMC, focusing not on the role of words/phrases with respect to their immediately surrounding words and phrases (i.e., the *parts*), but rather on their discourse, pragmatic, and social roles, (i.e., the *whole* (Fetzer, 2007)) to understand learners' macro-communicative behaviors. To assess these holistic language units learners use in TB-SCMC, and to compile a potential typology, it is important to consider the categories SCMC research has used to date, and their underlying theoretical premises. This study takes into account Ellis' (2003) suggestion that TBLT researchers and practitioners consider employing a "pluralistic approach" (p. 202) to the data-analysis process, such as providing readers with both psycholinguistic and sociolinguistic perspectives on the data set. Tarone (2007) asserts that a comprehensive SLA theory should consider both linguistic context, often referred to as the co-text, and the learner's social mindset (p. 845). From a theoretical linguistic perspective, Fetzer (2007) emphasizes that language units are normally situated in either a linguistic context or a social context. For instance, the Spanish sentence *Hace frío* ('It's cold') can be an indirect request with an imperative interpretation to turn up the heat. Under different circumstances *Hace frío* can be motivated by social variables where a person attempts to establish interpersonal contact with a stranger while waiting at a bus stop.

Three types of macro-communicative, holistic language units have been examined in the SCMC literature: general, discourse-pragmatic language units largely rooted in models of communicative competence, those associated with interactionist perspectives which tend to classify discourse-pragmatic units into even broader cause-effect chains, and ones primarily associated with a sociocultural perspective. Chun (1994) uses various categories of discourse inspired by models of communicative competence and pragmatics following Koike's (1989) definition of pragmatics, which is primarily

concerned with appropriateness and politeness of speech acts. Kern (1995) uses a general set of categories reflecting *discourse functions* such as assertions, greetings, narratives, questions, commands, delegation of floor, recapitulation of another's comment. Blake (2000) and Smith (2003, 2005) use an interactionist perspective to describe TB-SCMC behaviors that constitute learner negotiations, such as exchanges in which miscommunications relating to vocabulary and syntax are resolved. In these analyses, holistic language units are categorized as corrections, triggers, responses, and task-appropriate reactions to the responses in miscommunication chains. Many have subdivisions that relate to the larger discourse-pragmatic units focused on here, e.g., rephrasals, inferences, elaborations, metalinguistic talk (Smith, 2003, p. 43) as well as syntactic and lexical categories that lie at the root of miscommunications. Sociocultural analyses have documented holistic language units that reflect learners' orientation to the task and goals, e.g., intersubjectivity, private speech, self-regulated language episodes, and interpersonal mentoring (Darhower, 2002; Warner, 2004; Warschauer, 1999). Finally, Sotillo (2000) and Werry (1996) use hybrid approaches, documenting assertions, turn-taking strategies, as well as a number of SCMC-specific strategies, which represent what Kasper (2001) terms pragmatic "interactional practice" (p. 515). Sotillo (2000) and Werry (1996) also demonstrate the use of various sociocultural SCMC features, such as sarcasm, flaming, humor, insults, and language play (see also Belz & Reinhardt, 2004).

It is critical to understand that there is considerable overlap in the taxonomies used in these approaches even though their respective explanations of learner behaviors are rooted in different epistemologies (Kasper, 2001). General, discourse-pragmatic taxonomies employing categories such as assertions, commands, agreement indicators (Kern, 1995; Sotillo, 2000) are informed by definitions of pragmatics that emphasize the role of discourse markers, implicature in the interpretation of utterances which is as likely to be tied to the surrounding linguistic context as it is to the social context, as well as interactional practices/routines, and speech acts (Bardovi-Harlig, 1998).² Sociocultural perspectives focus on how learners' personal histories, motives, goals, and institutional perspectives shape general L2 abilities. Much of this research details L2 pragmatic development defined as "the study of communicative language use in a sociocultural context" (Belz, 2007, p. 45) and how these abilities develop as a result of and in the context of intercultural contexts (Kinginger & Belz, 2005).

In accordance with the preceding considerations, the analysis of the chat logs/corpus of the TB-SCMC experiment presented here employs the categories given in the [Appendix](#). The typology includes all three types of language units that have been reported in the general literature but is more narrowly focused on those described in TB-SCMC literature.³ This approach is consistent with the call to consider, when feasible, both the linguistic and the social context of learners' behaviors when examining the general discourse-pragmatic nature of TB-SCMC (Ellis, 2003; Fetzer, 2007; Tarone, 2007). This will allow a broad-based analysis of the dataset without biasing it toward any particular analytical framework described above.

RESEARCH QUESTIONS

The present study asks the following research questions:

1. What holistic language units occur most frequently in multimodal TB-SCMC tasks?
2. What holistic language units occur at different instructional levels, in different task types?
3. Is there an interaction between instructional level and task type in terms of the holistic language units that occur?

Participants

Thirty students from intact classes participated in the study: 12 second-year university-level learners and 18 third-year, university-level learners. The second-year ('intermediate level') learners were enrolled in fourth-semester Spanish classes at a medium-sized university and at a community college whose courses

are articulated with those of the university such that the course content is virtually alike. The third-year ('advanced level') learners were students from a 300-level composition course at the university with an emphasis on the written production of narrations, descriptions, and expository writing. All students had met or exceeded the learning outcomes from the previous course, i.e., the intermediate-level learners had successfully completed a third semester Spanish course and the advanced learners had successfully completed another 300-level course, e.g., advanced oral expression. The intact classes were traditional, FTF classes that employed a variety of multimedia activities, such as watching videos, and Internet exploration/research. While both levels of learners engaged in writing activities as mandated by the course objectives, no activities involved instant messaging and no other chat sessions were embedded into these courses. The researcher was not an instructor in these classes and did not participate in the experimental tasks. The tasks were integrated into one day's lesson plans, lasted an entire class period of one and one-half hours, and all students present that day participated in the tasks. No grades were awarded for participation as learners were expected to work with the class materials for that day just as they did during any other class.

Tasks

Learners participated in two Flash-based tasks (<http://london-underground.modlang.nau.edu/collenti/actividades/tareas.html>) and then discussed what they had discovered in a local area network via iChat, a synchronous conference application. The laboratory was equipped with individual Mac laptops placed on conference tables arranged in a semicircle. After being randomly assigned a partner and logging on, learners viewed a short, Flash-based introduction describing the activities in which they were to participate as well as instructions on how to use the technologies to accomplish the tasks

Interrupted Task Chatting Activity (ITCA)

In the first task, dyads worked for a detective agency to solve a murder. The interactive Flash piece introduced them to characters living in an apartment building where a murder occurred. Learners navigated through scenes to interview the characters. To query characters in a scene, e.g., about alibis, the timing of events, learners clicked on any of the five questions—written in Spanish—in a textbox, whereupon they received a text-based answer, such as the following.



Figure 1. Sample ITCA screen

To ensure that the learners carefully explored information about each character, questions were phrased in different ways. For example, to ask about the time of the character's actions, the following questions were randomly presented throughout the two tasks:

¿A qué hora lo hizo usted? *What time did you do it?*

¿A qué hora? *At what time?*

¿Qué hora era? *What time was it?*

To encourage exploratory information gathering, learners could ask each character three questions before the five displayed questions and the character disappeared. Students would then have to either exit the room to interview a previous character or move through a new door to interview a new one. They could later return to a room to pose any unanswered questions or even reread answers. The Flash program directed the learners at three intervals, to switch to iChat where the preassigned dyads were to chat about the information they gathered and hypothesize about the identity of the culprit. Each of the three exploratory intervals lasted 7 minutes, for a total of 21 minutes. The three chatting phases lasted 5 minutes, for a total of 15 minutes.

Posttask Chatting Activity (PTCA)

In the second task, dyads pretended to be upscale apartment tenants attempting to locate a safety deposit box key by interviewing various personnel (e.g., a window washer, a cook) to find out who might have the key. Again, to encourage exploration they were limited to asking only three of the five questions during any single visit to a room. The students interviewed the personnel for 21 minutes and then moved to iChat to chat about their hypotheses for 15 minutes. For technical reasons, one of the 6 intermediate-level dyads did not complete this task. This is taken into account in the quantitative analysis of the data.

The first task required learners to chat at predetermined intervals; the second task had learners gather all relevant information before chatting. Although both tasks allowed learners the same amount of time to interview characters and chat about their discoveries, the first forced learners to chat in 3 five-minute intervals, and the second eased the time pressure by giving participants 1 fifteen-minute chat interval. Following Robinson (2001), longer time intervals to solve tasks lead to more planning and use of more structurally and semantically complex utterances.

DATA ANALYSIS

A mixed-method analysis was employed for data analysis. It combined qualitative and quantitative perspectives to triangulate the data (Green & Caracelli, 1997). The unit of analysis was the communicative unit (c-unit): words, phrases, sentences, onomatopoeic formulations, or abbreviations with a communicative value (Abrams, 2003; Keller-Lally, 2006). The c-unit also encompasses multiple pieces of information within a turn, such as an entire proposition (Abrams, 2003). Because this study examined the function or purpose of learner utterances, the term *move* was used instead of *c-unit*.

Each dyad's iChat transcript was converted to a text document, and each exchange was divided into individual c-units. The coding categories are given in the Appendix. After the researcher manually coded each c-unit in each document for one of the coding categories, Python scripts were written to tabulate the frequency of any given category per dyad transcript for the statistical analyses presented in the next section. An inter-rater reliability analysis was employed to check the construct validity of the researcher's coding. Specifically, three random samples from each category were selected (along with the preceding and following c-unit). Two raters and the researcher, who served as the model rater, provided judgments of each sample's categorization. Fleiss kappa, which calculates the degree of agreement in classification over that which would be expected by chance, was used to measure agreement among the three raters.

Results showed that there was a high degree of agreement, with Fleiss kappa being .96. A kappa higher than .80 is considered almost perfect agreement.

RESULTS AND DISCUSSION

Table 1 presents the average frequency of each category *per dyad* by learner level and task.^{4,5}

Table 1. Mean Frequency Per Dyad by Category, Learner Level, and Task Type

Task	Group level 2 nd year		Total	Group level 3 rd year		Total	Group level Combined		Grand total (per dyad)
	ITCA (dyads=6)	PTCA (dyads=5)		ITCA (dyads=9)	PTCA (dyads=9)		ITCA total (dyads=15)	PTCA total (dyads=14)	
Agreement indicators	2.67 (sd=1.6)	1.2 (sd=1.6)	2 (sd=1.7)	2.89 (sd=2.8)	1.78 (sd=2.2)	2.33 (sd=2.5)	2.8 (sd=2.3)	1.6 (sd=1.9)	2.21 (sd=2.2)
Assertions	10.83 (sd=4.3)	5.00 (sd=4.2)	8.18 (sd=5)	15.44 (sd=6.5)	5.89 (sd=3.5)	10.67 (sd=7)	13.6 (sd=6)	5.6 (sd=3.6)	9.72 (sd=6.4)
Flaming	0 (sd=0)	0 (sd=0)	0 (sd=0)	0.11 (sd=0.3)	1 (sd=1.7)	0.56 (sd=1.3)	0.1 (sd=0.3)	0.6 (sd=1.4)	0.34 (sd=1)
Greetings-leave takings	2.83 (sd=1.3)	1.4 (sd=0.9)	2.18 (sd=1.3)	4.33 (sd=1.7)	1.89 (sd=0.8)	3.11 (sd=1.8)	3.7 (sd=1.7)	1.7 (sd=0.8)	2.76 (sd=1.7)
Humor	0.67 (sd=0.8)	0.2 (sd=0.4)	0.45 (sd=0.7)	5 (sd=7.3)	9.56 (sd=10.9)	7.28 (sd=9.3)	3.3 (sd=6)	6.2 (sd=9.7)	4.69 (sd=8)
Interpersonal discourse	5 (sd=0.9)	1.4 (sd=1.9)	3.36 (sd=2.3)	3.67 (sd=2.1)	1.67 (sd=1.7)	2.67 (sd=2.1)	4.2 (sd=1.8)	1.6 (sd=1.7)	2.93 (sd=2.2)
Interpersonal language episodes	0 (sd=0)	0.4 (sd=0.9)	0.18 (sd=0.6)	0 (sd=0)	0.44 (sd=0.9)	0.22 (sd=0.6)	0 (sd=0)	0.4 (sd=0.9)	0.21 (sd=0.6)
Intersubjectivity	0.67 (sd=1)	0.8 (sd=1.1)	0.73 (sd=1)	5.44 (sd=4.3)	2.89 (sd=3.4)	4.17 (sd=4)	3.5 (sd=4.1)	2.1 (sd=3)	2.86 (sd=3.6)
Knowledge gap	4.67 (sd=4.1)	1.4 (sd=2.2)	3.18 (sd=3.6)	1.78 (sd=1.4)	2.33 (sd=3)	2.06 (sd=2.3)	2.9 (sd=3)	2 (sd=2.7)	2.48 (sd=2.9)
Off-task discussion	1.5 (sd=3.7)	0.2 (sd=0.4)	0.91 (sd=2.7)	8.67 (sd=12.9)	2.89 (sd=4.5)	5.78 (sd=9.8)	5.8 (sd=10.7)	1.9 (sd=3.8)	3.93 (sd=8.2)
Sarcasm-insults	0 (sd=0)	0 (sd=0)	0 (sd=0)	0.78 (sd=1.7)	1.78 (sd=2.2)	1.28 (sd=2)	0.5 (sd=1.4)	1.1 (sd=1.9)	0.79 (sd=1.7)
Self-regulated language episodes	0.33 (sd=0.5)	0.2 (sd=0.4)	0.27 (sd=0.5)	1.11 (sd=1.1)	0.78 (sd=0.7)	0.94 (sd=0.9)	0.8 (sd=0.9)	0.6 (sd=0.6)	0.69 (sd=0.8)

The quantitative portion of the analysis assessed whether category frequencies differed significantly overall (Research Question 1) and whether category frequencies depended on instructional level and/or the task type (Research Questions 2 and 3) by submitting the data to a repeated-measures analysis of variance (ANOVA). There were three independent variables (Table 2). The between-subjects variables were task (ITCA and PTCA) and instructional level (intermediate- and advanced-level groups). The within-subjects variable was category, e.g., assertions, humor, containing thirteen levels as per Appendix). It should be noted, however, that not every dyad produced more than one instance of each of the categories. Since some cells contained zero values and others relatively high numbers, the distribution did not meet the assumption of normality, showing substantial positive skewness. A standard transformation of these types of data sets to allow for the use of ANOVA procedures is the rank correlation transformation (Conover, 1999). Accordingly, the ANOVA reports main effects and interactions based on the transformed data set.⁶

Table 2. Repeated-Measures ANOVA for Category, Level, and Task

Source	Sum of Squares	df	Mean Square	F	p
Tests of within-subjects effects					
Category	1313259.7	12	109438.3	21.4	0.00
Category X Task	163967.7	12	13664.0	2.7	0.00
Category X Level	170514.5	12	14209.5	2.8	0.00
Category X Level X Task	55071.0	12	4589.2	0.9	0.55
Error	1534644.6	300	5115.5		
Tests of between-subjects effects					
Intercept	11877039.6	1	11877039.6	637.8	0.00
Task	99646.2	1	99646.2	5.4	0.03
Level	139858.7	1	139858.7	7.5	0.01
Level X Task	17547.9	1	17547.9	0.9	0.34
Error	465582.2	25	18623.3		

With respect to the first research question, ANOVA showed that there was a significant within-subjects effect for category ($F=21.4$; $df=12,300$; $p = 0.00$), indicating that the thirteen categories were not equally represented across all conditions of the experiment. Post hoc Tukey's comparisons *on the ranked data means* (with an overall α of .05) revealed the following. Assertions ranked significantly higher than all other categories. Humor, off-task discussion, interpersonal discourse, intersubjectivity, greeting-leave taking, knowledge gaps, and agreement indicators had equal ranking. Finally, use of English, sarcasm-insults, self-regulated language episodes, flaming, and interpersonal language episodes ranked lower than the preceding group of categories.

Regarding the second and third research questions, the results indicate that the categories used were a function of task and of level, but not a combination of the two factors. The repeated measures ANOVA showed a within-subjects interaction between category and task ($F=2.7$; $df= 12,300$; $p = 0.00$), implying that learner behaviors differed by task. It also showed a within-subjects interaction between category and level ($F=2.8$; $df= 12,300$; $p = 0.00$), suggesting that learners at different proficiency levels engaged in different behaviors. However, the analysis did not show a within-subjects interaction between category, task, and level ($F=0.09$; $df= 12,300$; $p = 0.55$). All two-way comparisons are derived from the Tukey post hoc test on the ranked data (with separate α adjustments for the task and learner-level analyses; $\alpha = .05$).

Differences by Tasks

The post hoc analyses indicated that there were significant differences in six of the thirteen categories, with the ITCA containing higher ranks for assertions, interpersonal discourse, greetings-leave takings, knowledge gap, agreement indicators, and use of English. In general, the learners stated their hypotheses, summarized their discoveries, and evaluated each other's statements by using a large number of assertions and engaging in interpersonal discourse, especially in the ITCA, where time was of the essence. In the chatscript below, CJ and JL, both intermediate-level learners, discuss many details, and JL engages in interpersonal discourse by asking CJ which character(s) he had interviewed. They add increasing amounts of information to culminate with a conclusion.

Table 3. Assertive and Interpersonal Discourse in the ITCA

5:45 PM jl: Hablo con paco y dora, Chris. Quie'n hablas?	5:45 PM jl: I spoke with paco and dora, Chris. Who did you speak with?
5:50 PM cj: Hablé con Paco, el oio algo sobre 10:30	5:50 PM cj: I spoke with Paco, he heard something at about 10:30
jl: Dora oio alguien afuera la puerta de Paco o ??? No sea	jl: Dora heard someone outside Paco's door or ??? I don't know
5:55 PM jl: Tina dijo que mire' la televisio'n con Paco, mire'n CSI a la once.	5:55 PM jl: Tina said that she watched television with Paco, they watched CSI at eleven.
cj: Dora me dijo que oye algo sobre 11:00	cj: Dora told me that she heard something at about 11:00
jl: Dora dijo que tomo' mucho vino y no recuerdo' anda.	jl: Dora said that she drank a lot of wine and didn't remember anything.
6:00 PM jl: Cuando Paco volvio a su apartamento, ella dormio' en el sofa	6:00 PM jl: When Paco returned to his apartment, she was sleeping on the sofa
cj: Tina, in me opinion es una sospecho, mucho tiempop sola	cj: Tina, in my opinion is a suspect, a lot of time alone

Although this analysis uses ranked scores, an examination of the mean frequencies in [Table 1](#) indicates that the differences in off-task discussions and humor were greater than several of these 6 categories. Specifically, 5 of the 15 advanced-level dyads accounted for 86% of the off-task and humor instances across the two tasks. Ranked averages for these two categories were lower than the mean average because the categories were produced by a restricted set of advanced-level learners.

As reported above, the ITCA elicited more instances of greetings-leave takings than the PTCA most likely because the ITCA involved interruptions in the activity. Some dyads greeted each other each time they returned to the chat, possibly accounting for why the data showed a significantly greater number of greetings-leave takings in the ITCA than in the PTCA. The PTCA forced learners to complete all of the exploration phase before chatting about their hypotheses; thus dyads would have greeted each other only once.

Even though the analysis showed no significant differences for off-task discussion, during the ITCA learners engaged in these kinds of moves ($M=5.8$; $sd=10.7$) about three times as often ($M=1.9$; $sd=3.8$), possibly because, as discussed below, the advanced learners found both tasks to be less than challenging. The greater use of teasing and joking in the PTCA ($M=6.2$; $sd=9.7$) than in the ITCA ($M=3.3$; $sd=6$) may relate to the fact that there was more time to chat, or it may be due to the nature of the PTCA's content. In some instances, the learners blamed each other for the lost keys, as evidenced by the following exchange between these advanced-level learners.

Table 4. Humor in the PTCA

sep: es tu sep: eres un criminal sep: voy a ponerte en la carcel sep: no importa bd: si pero trabajo para el carcel, por eso tengo unos conneciones que tu no tienes	sep: it's you sep: you are a criminal sep: I'm going to put you in jail sep: it doesn't matter bd: yes, but I work for the jail, that's why I have connections that you don't have
---	---

Societal conventions allow people to joke about losing or taking keys, but the lack of humor in the ITCA may signify that humor about murder is not acceptable and that such discussions should be conducted objectively, as in the following exchange:

Table 5. Objective Exchanges in the ITCA by Advanced-Level Learners

la: tina dijo que estaba con paco	la: tina said that she was with paco
md: ooo es posible que era los dos?	md: ooo is it possible that it was the both of them?
md: ellos estan anamorados y quieren el dinero	md: they are in love and want the money
la: si , es muy posible	la: yes , it's very possible

The qualitative analysis suggests that the ITCA's topic may have forced learners to use more English for lack of lexical knowledge in Spanish. Useful lexical items for the ITCA such as Spanish equivalents for *culprit*, *blame*, *murder*, or *guilty* were probably unfamiliar to the learners, especially to the intermediate-level ones. On the other hand, most of the learners had been exposed to the word *keys* (llaves) and had learned how to say *I lost the keys* (e.g., se me perdieron las llaves).

Differences by Learner Level

The post hoc analyses indicated that there were significant differences in five of the thirteen categories, with the advanced-level learners using more humor, off-task discussion, intersubjectivity, sarcasm-insults, and self-regulated language episodes. However, sarcasm-insults and self-regulated language episodes were very infrequent overall, and the significant differences were most likely due to the intermediate-level learners' use of mere five instances of these two behaviors.

Both tasks were harder for the intermediate-level students. In line with Robinson's (2001) predictions about task difficulty as a function of overall proficiency, in both the ITCA and the PTCA, the intermediate-level learners were less proactive in nominating non-task-related topics, teasing or joking. They combined interpersonal discourse and assertions, which altogether comprised 51.8% (127 of 245 tokens) of their moves. Further evidence of the tasks' difficulty comes from the large number of knowledge gap moves, comprising 14.3% (35 of 245 tokens) of the intermediate learners' total moves. In a typical exchange given below, ADV expresses her frustration and confusion in two separate moves, and then provides a detail about her discoveries.

Table 6. Intermediate-Level Learners' Interactions (from the ITCA)

aw: y Tina durmio en la sofa despues Jorge salio	aw: and Tina was sleeping on the sofa then Jorge left
adv: no tengo no idea que pasa	adv: I have no idea what's happening
adv: muchas personas hay	adv: there are a lot of people
adv: jorge le gusta rifles	adv: jorge likes rifles
aw: el Dr. Torres es "sketchy"...haha	aw: Dr. Torres is "sketchy"...haha
adv: de acuerdo si	adv: I agree yes

The lesser difficulty of the tasks for the advanced-level learners allowed them the luxury to engage in humor and off-task discussions. Recall that humor and off-task discussions accounted for half of the advanced-level learner dyads. Likewise, the advanced level learners' intersubjectivity behaviors correlated significantly with the combined humor and off-task discussion counts ($r = 0.55$; $df=17$; $p = 0.02$).

In contrast to Antón and DiCamilla's (1998) conclusions that the L1 was the primary means to establish intersubjectivity, this study supports Darhower's (2002) findings that SMC intersubjective moves occur in the L2. This may depend on one's developmental level, since these learners were beyond the beginning level, the level of Antón and DiCamilla's participants. The following sample exchange between advanced-level learners is illustrative of humor and off-task discussions followed by intersubjective moves. They begin the ITCA with greetings and then tease one another about their physical qualities and what is correct Spanish. One participant gets the dyad on track by establishing intersubjectivity with a task-related question.

Table 7. Non-Task-Related Moves Followed by Intersubjective Moves

rt: hola compañera	rt: hi partner
rt: eres tan bonita hoy	rt: you look so pretty today
lh: no quiero ser tu companera	lh: i don't want to be your partner
lh: ahh, gracias	lh: ohh, thanks
lh: ok, ok	lh: ok, ok
rt: ¿porque?	rt: why?
lh: me gustan tus ojos de perrito	lh: i like your puppy dog eyes
rt: BLAH	rt: BLAH
lh: "blah" no es una palabra en espannol	lh: "blah" is not a word in spanish
lh: <i>emoticon: winking face</i>	lh: <i>emoticon: winking face</i>
rt: quién quieres preguntar primero?	rt: who do you want to ask first?

Of course, many of the advanced learners' exchanges involved assertions and attempts to solve the task, as evidenced in the following exchange from the ITCA.

Table 8. Advanced Learners' Use of Assertions

11:50 AM	11:50 AM
nrb: pensamos que jorge es la persona que mata la mujer	nrb: we think that Jorge is the person who kills the woman
nrb: el es parte del NRA	nrb: he's part of the NRA
kmp: haha...si tienes razon	kmp: haha...yes you're right
kmp: y tambien no es muy especifico en sus repuestas	kmp: and also he's not very specific in his answers
nrb: si y estaba solo	nrb: and he was alone
nrb: cuado ella se murio	nrb: when she died
kmp: si...estoy de acuerdo	kmp: yes...I agree

CONCLUSIONS

The analysis indicates that assertions are the single most common holistic language units produced in multimodal, TB-SCMC activities. Yet, these are accompanied by numerous behaviors that have a social purpose, such as humor, interpersonal discourse, and expressions of knowledge gaps, which keep individuals engaged with each other. The analysis of the four conditions reported here, however, suggests that this conclusion must be qualified, since the types of holistic language units learners generate in TB-SCMC depends on the developmental level and on task conditions. This study shows that lower-level learners in TB-SCMC use a restricted repertoire of holistic language moves. At the same time, TB-SCMC requires higher levels of proficiency for learners to generate an expanded repertoire of moves. Furthermore, attention to metalinguistic issues seems to have a low priority in TB-SCMC regardless of one's L2 developmental level.

When learners generate moves whose interpretation most readily derives from the linguistic context, most are declarative in nature (i.e., assertions), with interpersonal discourse (such as asking questions) being less common. This highly assertive pattern may occur most when learners are linguistically challenged by a task, since the intermediate-level learners favored this move over all others. Overall assertive discourse may also characterize TB-SCMC activities that allow little time for dyads to interact, as the ITCA saw a greater proportion of assertions than the PTCA. In either case, when processing mechanisms are stressed, TB-SCMC language tends to take the form of statements of fact.

Regarding the learners' moves whose interpretation most readily derives from the social context, as other researchers have noted, learners produce a considerable variety of relevant behaviors in TB-SCMC. It appears that these behaviors are more prevalent among learners at higher levels of proficiency, since the

advanced learners produced relatively more instances of humor and even off-task discussions, which may have led them to see the need to produce intersubjective moves. There is some evidence that the topic, such as death, also influences the nature of the social behaviors in TB-SCMC.

It is also necessary to mention what did not occur. First, there was very little use of self-regulated language episodes. It may be that these occurred orally or during the chat (Smith, 2008), and if so, their absence may indicate an important difference between SCMC and FTF learning. Recall, however, that the research to date indicates that learners demonstrate few moves that suggest that they concern themselves with metalinguistic issues in TB-SCMC (Lee, 2002). Thus, it may be that an important distinctive characteristic of TB-SCMC is that task demands detract learners from attending to metalinguistic issues, especially with less-advanced L2 learners. Second, as in Darhower (2002), learners did not employ English to establish intersubjectivity; they probably used L1 in the ITCA due to lexical deficiencies. This was especially true of intermediate learners. SCMC seems to be particularly effective in promoting the use of L2 to accomplish these tasks. One reason may be that the written mode offered by SCMC allows learners to more easily formulate responses because of the extra time allotted to access the lexicon and to hold L2 linguistic information in short term memory (Payne & Ross, 2005).

What advice is there for teachers and technology experts? The research to date has tended only to examine learner behaviors generated in SCMC without coupling such tasks with multimodal materials (Blake, 2000 and Keller-Lally, 2006 are notable exceptions). There is little evidence that coupling SCMC with other multimedia technologies inhibited or overloaded the learning process, possibly because the multimodal experience was couched in structured tasks. Spiro et al. (1991) advise that multiple representations of information (such as those in a multimodal experience) should be contextualized within a *case-based* setting, a condition that TBLT meets (Blake, 2000). It would be interesting to investigate at what point the multimodal experience becomes an overload. Would learners engaged in a gaming experience where they communicated in SCMC while interacting with highly multimodal gaming materials exhibit overload?

Although this study is comparable in terms of sample size and task order to other experiments of a similar nature, including Warner (2004) and de la Fuente (2003), it suffers from two main limitations both common to mixed-method designs with intact classes. First, the generalizability of the results would be greater with larger samples. Second, although sample size and experimental logistics prevented as much, randomizing the dyads to both possible orderings of the tasks would control for ordering effects.

The present study adds to the understanding of the holistic language units that characterize the TB-SCMC learning environment. Future research should address several questions stemming from this research. First, what is the threshold of task difficulty that would achieve a balance between assertive and affective discourse? The types of moves reported in the research vary widely, probably due to the variety of task and experimental designs employed. The relationship between types of moves and task type will require a great deal more study for pedagogues to make predictions about the types of utterances learners will use in SCMC. Nevertheless, this study adds to our understanding of the language behaviors that occur in the language-learning classroom when learners engage in TB-SCMC with multimodal materials.

NOTES

1. Learner behaviors are defined here as electronic messages generated in chat.
2. Bardovi-Harlig (1998) details the extent to which traditional pragmatics studies, especially as they relate to speech acts, have been studied in SLA. She details how this research has studied such themes as mitigators and downgraders, modals *could/would*, appropriate prosody, socially relevant inflexional and pronominal morphology (T/V), embedding (*creo que... I think that*), and learning formulaic expressions. It is important to emphasize, nonetheless, that these themes are also treated by sociocultural perspectives,

and that themes such as *socially relevant inflexional and pronominal morphology* can be treated from different theoretical perspectives.

3. Since this study's research questions are not framed within the interactionist framework, the researcher does not employ categories such as *trigger*, *response*, etc. This is not to say that relevant exchanges are not counted in the present study. Rather, they would be coded differently. Smith (2003) details, for example, how response instances constitute rephrasals or elaborations at the level of discourse. Such instances in the present study might fall into the category of self-regulated language episodes. The difference in coding schemes represents a difference in research questions and theoretical perspectives.

4. The author wishes to thank Dr. Roy St. Laurent at the Northern Arizona University *Statistical Consulting Lab* for his assistance with the statistical analysis for this article. Any errors are attributable solely to the present author.

5. Upon consultation with a statistician, it was determined that the basis upon which to compute frequencies should be the number of tokens (per category) per dyad rather than per individual participant, so as not to risk issues of co-linearity. The occurrence of an instance of many of the categories resulted because of (communicative) factors that were dependent on a dyad's interaction (e.g., the number of greetings that one participant produced would probably influence the number produced by his/her partner); the amount of variation between two participants of a dyad was most likely not independent.

6. This transformation entails ranking each cell's frequency (e.g., the frequency of assertions for dyad X within task A) from highest to lowest. The lowest cells do not generally receive ranks of zero because so-called *ties* receive the same ranking. Since a large data set like this has several ties, the minimum frequency scored a rank of 86.5 out of 377 (the total number of cells ranked). Conover (1999) notes that rank transformations produce sufficiently robust normal distributions so as to submit the resulting data set to the "usual analysis of variance" (p. 419).

7. These utterances were categorized differently from humor and from intersubjectivity because they were not humorous nor were they uttered to try to establish a shared perspective; they did not pertain to the content or to the completion of the task.

8. In the data set these exclusively represented gaps in lexical knowledge (cf. Chun, 1994; Keller-Lally, 2006; Kern, 1995).

9. There were no instances in the data set where English was used to establish intersubjectivity.

APPENDIX: Larger language unit categories used in the analysis

Category	Definition	Original chatscript	Translation
Agreement indicators	moves expressing agreement about hypotheses to complete the task (cf. Sotillo, 2000)	kmp: oh, ok. entonces victoria se parece la más cupable nrb: estamos de acuerdo	kmp: oh, ok. then victoria seems to be the most guilty nrb: we agree
Assertive discourse	moves where an utterance provides information in a declarative fashion (cf. Chun, 1994; Kern, 1995; Sotillo, 2000)	ac: Investiga jorge ac: porque el dijo que no hablaba con nadie, pero nora dijo que ella hablaba con el ac: e el tieno una arma	ac: investigate jorge ac: because he said that he didn't speak with anyone, but nora said she spoke with him ac: he didn't have a weapon

Flaming	expressions of aggression, exaggerated emotions, bluntness, or hostility in excess of FTF conversational appropriateness (cf. Sotillo, 2000)	kf: que pienso? kf: ERA TU??? la: ladrona sucia!	kf: what do I think? kf: WAS IT YOU??? la: dirty thief!
Greetings and leave takings	expressions of greeting and leave taking (cf. Chun, 1994; Darhower, 2002; Kern, 1995; Sotillo, 2000;)	cj: Hola; yo soy Chris. jl: Hola; soy Janet.	cj: Hi; I'm Chris. jl: Hi; I'm Janet.
Humor	moves involving or reacting to teasing and joking (cf. Darhower, 2002; Sotillo, 2000)	bd: voy a estudiar con ellos este verano bd: es la verdad sep: quien sep: los miembros del rifle association? bd: si bd: necesito practicar	bd: i'm going to study with them this summer. bd: really sep: who sep: the members of the rifle association? bd: yes bd: i need to practice
Self-regulated language episodes	self-made corrections, a type of private speech (cf. Sotillo, 2000; Kern, 1995)	cp: estas mi companero en este juego cp: juego*	cp: you are my classmate in this game [misspelled] cp: game* [spelled correctly]
Interpersonal discourse	instances where learners query each other or evaluate each other's hypotheses towards solving an immediate goal	mk: Pienso que es el hombre del refrigerador mec: si, pero tenemos que investigar mas mec: piensas que es demasiado sospechoso? mk: mm si sabes much sobre antonio?	mk: i think it's the refrigerator man mec: yes, but we have to investigate some more mec: do you think he is too suspicious? mk: mm yes do you know much about antonio?
Intersubjectivity	moves where learners orient themselves to the task (or "huddle up") to determine how to get started (e.g., <i>What do we have to do?</i>), what to do next (e.g., <i>What else do we have to do?</i>), or to refocus on the task (e.g., <i>So... who do you think it was?</i>) (cf. Darhower, 2002)	ac: Creo que es e'l. jm: ok ac: el fin jm: pues necesitamos un reporte en un documento o solo en ichat? ac: solamente nuestras ideas en ichat	ac: i think that it's him. jm: ok ac: the end jm: well do we need a report in a document or only in ichat? ac: only our ideas in ichat

Knowledge gap	recurring moves not previously documented in the literature that reflected students' state of mind about their (in)ability to provide information in these tasks, e.g., "No sé" ('I don't know') or "Hay muchas personas" ('There are many people/characters') - a conciliatory response to a question asking for a specific hypothesis	la: no se quien es la persona tampoco kam: me [no] recuerdo la: quien piensas? kam: no se. no soy terminar	la: i don't know who the person is either kam: i do [not] remember la: what do you think? kam: i don't know. i'm not finished.
Off-task discussion	deviations from the task, e.g., discussions about the value of Macs over PCs, video games, and points for the final exam ⁷ (cf. Chun, 1994; Darhower, 2002; Keller-Lally, 2006; Sotillo, 2000)	jm: si' es muy bien' para mi' ac: actualmente es cinco puntos de % para su ensayo mas peor jm: oh es ma's bie'n jm: tenemos un respaso hoy? jm: para el final?	jm: yes it is very good for me ac: actually it is five percentage points towards your worse essay jm: oh that's better jm: do we have a review today? jm: for the final?
Sarcasm-insults	moves where learners blame each other or call each other names (cf. Darhower, 2002; Sotillo, 2000; Warner, 2004)	tr: dejame en paz tr: vete ya	tr: leave me alone tr: leave
Use of English	English words or phrases ^{8, 9}	jm: si' es posible, porque e'l no tiene un "alibi" ac: y e'l dijo estaba tratando a "blame" a los otros ac: si	jm: yes it's possible, because he doesn't have an "alibi" ac: and he said that he was trying to "blame" the others ac: yes

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